

Patent Claims

1. A method for transmission of safe process information, wherein two or more process signals ( $S_{211}$ - $S_{212}$ ,  $S_{221}$ - $S_{222}$ ,  $S_{100}$ ), which are detected redundantly in order to identify an event which is relevant to system safety, are converted to a single process signal ( $S_1$ ,  $S_{110}$ ) for system-based further processing.
2. The method as claimed in claim 1, wherein, furthermore, the redundantly detected process signals ( $S_{211}$ - $S_{212}$ ,  $S_{221}$ - $S_{222}$ ,  $S_{100}$ ) are detected as far as the conversion process via two or more channels, and the converted process signal ( $S_1$ ,  $S_{110}$ ) is transmitted via one channel.
3. The method as claimed in claim 1 or 2, wherein, furthermore, the detection process is in digital or analog form.
4. The method as claimed in one of the preceding claims, wherein, furthermore, the conversion process is carried out to form a digital process signal ( $S_1$ ,  $S_{110}$ ).
5. The method as claimed in one of the preceding claims, wherein, furthermore, a 1-bit data item is transmitted as the useful content of the process signal ( $S_1$ ,  $S_{110}$ ).
6. The method as claimed in one of the preceding claims, wherein, furthermore, the transmission of the converted process signal ( $S_1$ ,  $S_{110}$ ) is protected.
7. The method as claimed in one of the preceding claims, wherein, furthermore, at least one check bit is attached to the useful content of the converted process signal ( $S_1$ ,  $S_{110}$ ), in response to the conversion process.

8. The method as claimed in one of the preceding claims, wherein, furthermore, a CRC method is used in order to produce the at least one check bit.

9. The method as claimed in one of the preceding claims, wherein, furthermore, the conversion process is carried out at a point in the process signal transmission path which is and/or can be predetermined as desired.

10. The method as claimed in one of the preceding claims, wherein, furthermore, the process signal ( $S_1$ ,  $S_{110}$ ,  $S_{120}$ ) which is transmitted on a single channel within the system is once again converted to two or more process signals ( $S_{130}$ ) which, in particular, are carried via separate channels, in a system output component (13, 130) which is and/or can be predetermined.

11. An apparatus for safe transmission of process signals ( $S_{211}$ - $S_{212}$ ,  $S_{221}$ - $S_{222}$ ,  $S_{100}$ ) which are detected redundantly for system safety, distinguished by means (11, 110) for conversion of process signals ( $S_{211}$ - $S_{212}$ ,  $S_{221}$ - $S_{222}$ ,  $S_{100}$ ), which are supplied on two or more channels, to a single process signal ( $S_1$ ,  $S_{110}$ ) which can be transmitted via one channel.

12. The apparatus as claimed in claim 11, furthermore comprising means (12, 120) for system-based further processing of process signals ( $S_1$ ,  $S_{110}$ ) which are carried on one channel.

13. The apparatus as claimed in claim 11 or 12, in which the conversion means has associated with it an input component (11), an output component (13), an intelligent unit, and/or a

mechatronic unit.

14. The apparatus as claimed in one of claims 11 to 13,  
wherein, furthermore, the conversion means (11) is designed  
5 to produce a 1-bit data item ( $S_1$ ).

15. The apparatus as claimed in one of claims 11 to 14, in  
which the conversion means (11) comprises a logic AND gate.

10 16. The apparatus as claimed in one of claims 11 to 14,  
wherein, furthermore, the conversion means (11, 110) has  
means for protection of the converted process signal ( $S_1$ ).

17. The apparatus as claimed in claim 16 wherein,  
15 furthermore, the conversion means (11, 110) has, for  
protection purposes, means for generation of at least one  
check bit and for attachment of the at least one check bit to  
the signal content of the process signal ( $S_1$ ).

20 18. The apparatus as claimed in one of claims 11 to 17,  
wherein, furthermore, the conversion means (11, 110) is  
designed for application of a CRC method.

19. The apparatus as claimed in one of claims 11 to 18,  
25 wherein, furthermore, the conversion means comprises hardware  
and/or software elements.

20. A safety system, in particular comprising at least one  
network for an automation system, having at least one  
30 apparatus as claimed in one of claims 11 to 19.

Use of an apparatus as claimed in one of claims 11 to 19 for  
carrying out the method as claimed in one of claims 1 to 10,  
in particular within a safety system as claimed in claim 20.